

### **AMENDMENTS TO THE DRAWINGS**

The attached three sheets of formal drawings replace the original three sheets of informal drawings submitted with the application.

These new sheets of drawings are intended to overcome the objection raised by the Examiner in paragraph 3 of the Office Action.

## **REMARKS**

Reconsideration and allowance of the claims are requested.

Claim 3 has been amended to overcome the objection raised by the Examiner in paragraph 5 of the Office Action. A similar change has been made to claim 16.

Claims 1, 11 and 17-26 have been amended to correct clerical errors. Specifically, claims 1, 11 and 24 have been amended to correct erroneous references to "sensing array" or "signal array" and to clarify that claims 17-26 are dependent apparatus claims. Dependent claims 5-7 and 18-20 also have been amended to conform with amendments made to independent claims 1 and 14 as discussed in more detail below.

New formal drawings have been submitted to replace the informal drawings currently on file in this application to overcome the objection raised by the Examiner in paragraph 3 of the Office Action.

The objection to the specification set forth in paragraph 2 of the Office Action is not understood because no "substitution specification" was ever filed by the applicant. Instead, it appears that the Examiner may have mistaken the certified priority document submitted to the International Bureau on February 23, 2006 as a substitute specification filed by the applicant, which was not the case. Thus, the objection to the specification should be withdrawn.

The objection to the specification set forth in paragraph 4 of the Office Action is respectfully traversed.

The term "discretized" is a common mathematical term used in fluid mechanics, seismic wave propagation and other fields. A Google search reveals more than one hundred thousand "hits" for the term. The following is a definition of "discretization" (from Wikipedia):

"In mathematics, discretization concerns the process of transferring continuous models and equations into discrete counterparts. This process is usually carried out as a first step toward making them suitable for numerical evaluation and implementation on digital computers. In order to be processed on a digital computer another process named quantization is essential."

In addition, a number of scientific citations can be found, among them:

Fuzzy interpretation of discretized intervals

Xindong Wu

Fuzzy Systems, IEEE Transactions on

Volume 7, issue 6, Dec 1999 Page(s): 753 -759

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Summary: When there are both numerical and nominal attributes in a database existing data mining systems (such as rule induction and decision tree construction) discretize numerical domains into intervals and the discretized intervals are treated in a similar way to nominal values during induction. This paper describes a type of fuzzy intervals implemented in the HCV version 2.0 rule induction software for the interpretation of rule induction results when rules with sharp intervals do not clearly apply to a test example at hand. A battery of experimental results with HCV show that these fuzzy intervals are useful.

and

## Nonlinear Phenomena and Stability Analysis for Discretized Control Systems

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**Keywords:** Nonlinear control systems, discrete-time systems, discretization, quantization, robust stability, Popov criterion.

**Abstract:** This paper analyzes the nonlinear phenomena and stability of discrete-time and discrete-value (discretized/quantized) control systems in a frequency domain. In this study, it is assumed that the discretization is executed on the input and output sides of a nonlinear element at equal spaces, and the sampling period is chosen of such a size suitable for the discretization in the space. Based on the premise, the discretized (stepwise) nonlinear characteristic is examined from two viewpoints, i.e., global and local. By partitioning the discretized nonlinear characteristic into two sections and by defining a sectorial area over a specified threshold, the concept of the robust stability condition for nonlinear discrete-time systems is applied to the discretized nonlinear control system in question. As a result, the nonlinear phenomena of a discretized control system are clarified, and the stability of discretized nonlinear feedback systems is elucidated.

Thus, it is clear that the word "discretized" is a common and well understood term that is properly used by the applicant in the instant disclosure and claims.

The claims were rejected under 35 USC § 102 as being anticipated by John (US 4,974,598). The rejection is respectfully traversed.

John does not disclose a discretized sensor array for measuring and collecting discretized acoustic or electromechanical signals to determine vital signs, as now recited in the independent claims. Instead, John discloses a system which is based on electrocardiography for measuring electrical heart signals (i.e., ECG signals) on the surface of the skin to diagnose heart disease. John does not disclose a system for measuring acoustic (sound) or electromechanical (body movement) signals that can be used to determine a patient's vital signs, such as blood pressure.

The dependent claim distinguishes over John for the same reasons as the independent claims and additionally distinguish over John by other features recited in the dependent claims.

For example, dependent claims 11-12 and 24-25 call for computing momentum flux and calculating vital signs from the momentum flux. This approach can be used to measure the movement of blood or other mass through the body as the basis for detecting and monitoring vital signs. In contrast, in an ECG system like John, heart disease is diagnosed by detecting abnormal spatio-temporal patterns of voltage on the surface of the skin.

Because the invention is new and unobvious, and because new and unobvious features have been specifically set forth in the claims, and because the references do not suggest those new and unobvious features, and because all the requirements of the Office Action have been met, reconsideration and allowance of the claims are requested.

Should the Examiner have any questions concerning this Amendment, Applicants request the Examiner to contact the Applicants' attorney, Craig Bailey, at (310) 824-5555.

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Respectfully submitted,

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